

### **ABSTRACT**

A new multilayer dielectric film for improving dielectric constant and thermal stability of gate dielectrics is provided. The multilayer dielectric film comprises a first layer formed of a metal oxide material having a high dielectric constant, and a second layer formed on the first  
5 layer. The second layer is formed of a metal silicate material having a dielectric constant lower than the dielectric constant of the first layer and a thickness smaller than the thickness of the first layer. A semiconductor transistor incorporating the multilayer dielectric film is also provided.

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